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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,056	04/16/2004	M. Saif Islam	200312090-1	9464

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FORT COLLINS, CO 80527-2400

EXAMINER

PHAM, THANHHA S

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/826,056

Applicant(s)

ISLAM ET AL.

Examiner

Thanhha Pham

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9, 12-21, 24 and 43-57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-9, 12-21, 24 and 43-53 is/are allowed.
- 6) ☒ Claim(s) 54, 55 and 57 is/are rejected.
- 7) ☒ Claim(s) 56 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☒ Other: attachment.

## DETAILED ACTION

This Office Action is in response to Applicant's Amendment dated 01/17/2006.

### *Claim Objections*

1. **Claim 13 is objected to because of informalities. Appropriate correction is required to clarify scope of claim.**

► With respect to claim 13,

line 13, typographical error "a material the semiconductor substrate"  
should be changed to "a material of the semiconductor substrate"

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 54, 55 and 57, as being best understood, are rejected under 35 U.S.C. 102(e) as being anticipated by or, in alternative, under 35 U.S.C. 103(a) as obvious over Chou et al [US 2004/0156108].**

*\*\*\*Notice: It is noted that process limitations of detail of polished characteristic in claims 54 does not carry weight in a claim drawn to structure because distinct structure is not necessarily produced. See In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). In addition, a "product by process" limitation is directed to the product per se, no matter how*

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*actually made, in re Hirao, 190 USPQ 15 and 17 (footnote 3). See also In re Brown, 173 USPQ 685 (CCPA 1972); In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324 (CCPA 1974); In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90; and In re Marosi et al., 218 USPQ 289 (Fed. Cir. 1983); all of which made clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product by a new method is not patentable as a product, whether claimed in "product by process" claims or not. "Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). In addition, this rejection based on a scope of claims that a material of semiconductor layer, a first material and a second material are the same material since independent claim 54 does not cite a difference between the first material, the second material and the semiconductor material.*

Chou et al (figs 13-17's, text [0001]-[0099]) discloses the claimed imprinting apparatus comprising: a semiconductor substrate (NIL mold 20A, fig 13C or 15, text paragraph [0074]) having a (110) direction planar surface, the semiconductor substrate having a trench (see fig 15 as attachment: trench defined by the vertical sidewalls noticed in figure) with vertical sidewalls, the vertical sidewalls being aligned with (111) vertical lattice planes of the semiconductor substrate; a plurality of vertical structures disposed in the trench between the vertical sidewalls (see fig 15 as attachment); and alternating layers of a first material and a second material in the trench, the second material layers having portions that extend vertically, the vertically extending portions being the plurality of the vertical structures, wherein the vertical structures are spaced apart from each other and from the vertical sidewalls of the trench to form a mold that provide a pattern for imprinting, wherein one layer of the first material is adjacent to the semiconductor substrate in trench, a thickness of the first material layer defines spaces between the vertical structures and further defines spaces between the vertical sidewall of the trench and a vertical structure of the plurality of the vertical structure that is adjacent to the vertical sidewall of the trench, wherein the alternating layers define an internal depth of the imprinting apparatus (see fig 15 as attachment for details).

***Allowable Subject Matter***

2. Claims 1-7, 12-21, 24, and 43-53 are allowed.

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3. Claim 56 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The following is a statement of reasons for the indication of allowable subject matter:

► Recorded Prior Art fails to disclose or suggest combination structure of imprinting apparatus as cited in claim 1 including the trench vertical sidewalls aligned with (111) vertical lattice planes of the semiconductor substrate, a plurality of vertical structures disposed in the trench between the trench vertical sidewalls, a material of the vertical structures being different from a material of the semiconductor substrate wherein the plurality of the vertical structures being spaced apart from each other and from the trench vertical sidewalls to form a mold that provides a pattern for imprinting.

► Recorded Prior Art fails to disclose or suggest combination structure of imprinting apparatus as cited in claim 13 including: sidewalls of a trench etched in the semiconductor substrate along spaced apart (111) vertical lattice planes such that the trench sidewalls are (111) vertical planes; and a plurality of vertical structures disposed in the trench, the vertical structure being nano-scale space apart and spaced from the trench sidewalls, a vertical structure of the plurality having opposing sides and an end, a side of the vertical structure facing one of a side of an adjacent vertical structure and a trench sidewall, the end having a horizontal surface coplanar with the (110) planar surface of the semiconductor substrate, a material of the plurality of vertical structure being different from a material of the semiconductor substrate wherein the plurality of

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vertical structures between the trench sidewalls provide a nano-scale patterned for nano-imprinting.

► Recorded Prior Art fails to disclose or suggest combination structure of imprinting apparatus as cited in claim 50 including: a substrate that is a semiconductor polished in a [110] direction, the substrate having a trench with sidewall that are vertical, the sidewalls being aligned with (111) vertical lattice planes of the substrate; a plurality of vertical structures disposed in the trench between the sidewalls, a material of the vertical structures being distinct from a material of the substrate wherein the vertical structure are spaced apart from each other and from the sidewalls of the trench to form a mold that provides a pattern for imprinting.

► Recorded Prior Art fails to disclose or suggest combination structure of imprinting apparatus as cited in claim 54 including wherein each of the first material, the second material and a material of the semiconductor substrate are different from one another as characteristics in claim 56.

### ***Response to Arguments***

5. Applicant's arguments filed on 01/17/2006 have been fully considered but they are not persuasive.

6. In regarding to Applicant's argument on pages 16-17, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., no other material (s) that distinguishes from the substrate material) are not recited in the rejected claim(s).

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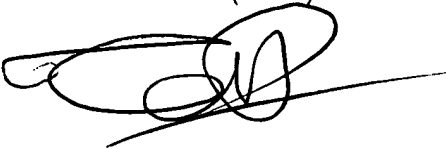
Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'TH' or similar, with a long horizontal line extending to the right.

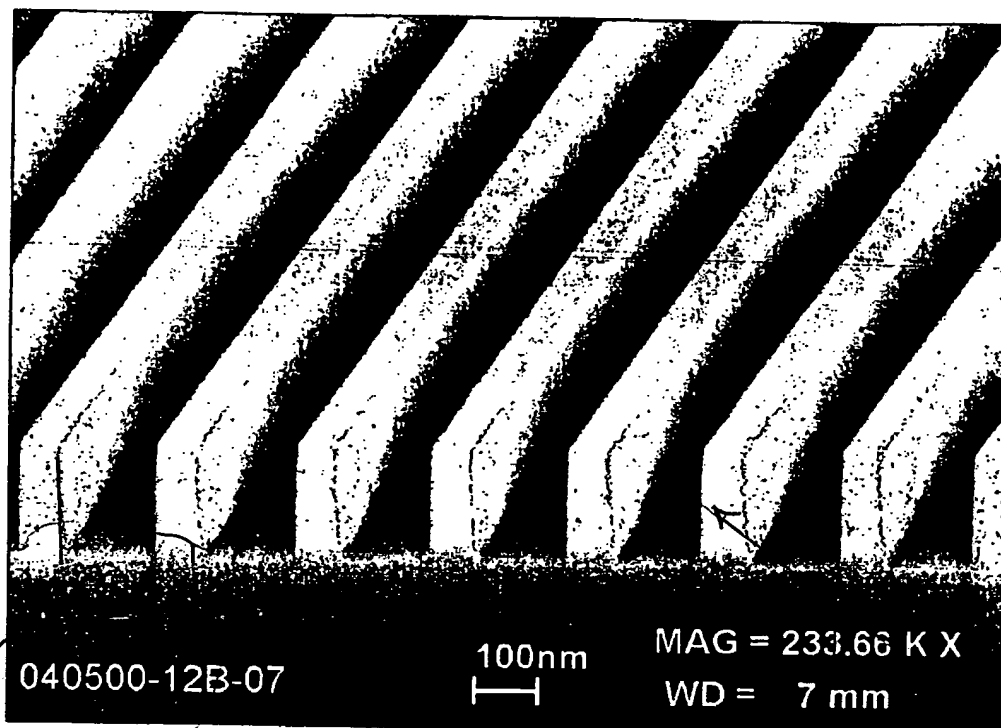
Thanhha Pham



# ATTACHMENT

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layer  
of 1st material

layer  
of 2nd  
material

**Fig. 15**

trench